

What is claimed is:

- 1     1.     A method for forming optical fiber preforms, comprising steps of:  
2             providing a first plasma torch having a coil for coupling plasma energy,  
3     said coil having a first diameter;  
4             providing a plurality of targets, each having a longitudinal axis,  
5     arranged such that said longitudinal axes are separated from one another by  
6     a spacing distance normal to said longitudinal axes;  
7             rotating said plurality of targets simultaneously about mutually parallel  
8     axes of rotation;  
9             depositing a glass simultaneously on said plurality of targets, using  
10    said first plasma torch, to form a plurality of intermediate preforms each  
11    having a first preform diameter;  
12            providing a plurality of second plasma torches, each having a coil for  
13    coupling plasma energy, each of said coils having a second diameter, said  
14    second diameter being smaller than said first diameter; and  
15            depositing a glass on said plurality of intermediate preforms using said  
16    plurality of second plasma torches to form a corresponding plurality of final  
17    preforms.
- 1     2.     A method according to claim 1, wherein a sum of said spacing  
2     distances of all adjacent pairs of said targets is less than said first coil  
3     diameter.
- 1     3.     A method for forming optical fiber preforms, comprising steps of:  
2             providing a plurality of targets;  
3             rotating said plurality of targets simultaneously about mutually parallel  
4     axes of rotation;  
5             providing a first plasma torch having a coil for coupling plasma energy,  
6     said coil having a first diameter;  
7             depositing glass on said targets by moving said first plasma torch  
8     along said targets parallel to said axes of rotation;

9 providing a second plasma torch having a coil for coupling plasma  
10 energy over a portion of each of said plurality of targets, said coil having a  
11 second diameter, said second diameter being greater than said first diameter;  
12 and  
13 depositing glass on said targets by moving said second plasma torch  
14 along said targets parallel to said axes of rotation.

1 4. A method for forming optical fiber preforms, comprising steps of:  
2 providing a first plasma torch having a coil for coupling plasma energy,  
3 said coil having a first diameter;  
4 providing a plurality of targets, each having a longitudinal axis,  
5 arranged such that said longitudinal axes are separated from one another by  
6 a spacing distance normal to said longitudinal axes;  
7 rotating said plurality of targets simultaneously about their respective  
8 longitudinal axes;  
9 depositing a glass simultaneously on said plurality of targets, using a  
10 plasma torch;  
11 detecting a diameter of one or more of said targets;  
12 increasing said spacing in response to said detected diameter; and  
13 depositing a glass simultaneously on said plurality of targets with their  
14 longitudinal axes separated from one another by said increased spacing.

1 5. A method for forming optical fiber preforms, comprising steps of:  
2 providing one plasma torch having a coil for coupling plasma energy ,  
3 said coil having a fixed diameter;  
4 providing a plurality of targets, each having a longitudinal axis,  
5 arranged such that said longitudinal axes are separated from one another by  
6 a spacing distance normal to said longitudinal axes;  
7 rotating said plurality of targets simultaneously about their respective  
8 longitudinal axes;  
9 depositing a glass simultaneously on said plurality of targets, using a  
10 plasma torch;

- 11 detecting a diameter of one or more of said targets;
- 12 increasing said spacing in response to said detected diameter;
- 13 modifying the plasma torch by increasing the cross section area of the
- 14 plasma torch and keeping the surface velocity constant; and
- 15 depositing a glass simultaneously on said plurality of targets with their
- 16 longitudinal axes separated from one another by said increased spacing.